

THE EFFECT OF FLOOD TO QUALITY INDEX OF SOIL PHYSICAL PROPERTIES AT THE DOWNSTREAM OF KURANJI RIVER WATERSHED, PADANG CITY

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ABSTRACT: The downstream of the Kuranji watershed of Padang City is vulnerable to flood due to the changes of land use into settlements area. Land use changes have changed the soil physical properties and its infiltration. The inundation has changed soil physical properties, such as layers, textures, volume weight, pores, permeability, and soil organic matters. The objective of this research is to analyze the quality index of soil physical properties due to flood at the watershed of the downstream area of Kuranji River of Padang City. Research methodology adopted is by conducting a field survey. Location of the soil sample is selected by purposive random sampling and was analyzed at the Department of Soil Science Andalas University. Soil physical properties data was arranged as minimum data sets (MDS) to be analyzed with principal component analysis to identify the main factors most affected by the flood. The results show that the main soil physical properties influenced by the flood are texture and soil organic matter. Based on the calculation of selected values from the MDS data, the quality of the downstream Kuranji watershed is moderate to good.

Keywords: Flood, Watershed, Soil quality index, Soil physical properties

1. INTRODUCTION

Floods can be inferred as a relatively high flow that transcends natural or artificial embankments in the river, varying magnitude by season, month to month, year to year [1]. Flooding can also be inferred as the flow of river water flow that is relatively larger than usual as a result of rain down in the upstream or in a specific place continuously so that can not be accommodated by the existing river flow, the water overflows out and inundates the area surrounding [2]. Flood is an ordinary

management of humans. Floods frequently occur in areas that have low elevation. According to Aprisal et al [3] floods generally are influenced by three main factors, namely (1) meteorological factors, (2) watershed factors, and (3) human factors. Critical meteorological factors are precipitation or rain.

The amount of rainfall in the upper watershed area of Kuranji river is quite high with an annual average of about 3,000-5,000 mm, and the erosion (rain damage to soil 5,603.11) is also high. Therefore, when viewed from the aspect of